



MATS School of Engineering & I.T
MATS University, Raipur
Scheme of Teaching & Examination
IVth Semester
B.Tech in Civil Engineering



S. No.	Course code	SUBJECT	Periods per week			Evaluation Scheme		Total Credits
			L	T	P	IM	ESE	
THEORY								
1	BT440	Structural Analysis II	4	0	0	30	70	4
2	BT441	Engineering Geology	3	0	0	30	70	3
3	BT442	Surveying II	3	0	0	30	70	3
4	BT443	Civil Engineering Drawing	3	0	0	30	70	3
5	BT444	Building Construction	3	0	0	30	70	3
6	BT445x	Open Elective-I	3	0	0	30	70	3
PRACTICAL								
7	BT446	Civil Engineering Drawing Lab	0	0	2	20	30	1
8	BT447	Surveying-II Lab	0	0	2	20	30	1
9	BT448	Structural Analysis-II Lab	0	0	4	20	30	2
10	BT449	Engineering Geology Lab	0	0	2	20	30	1
TOTAL			19	0	10	540	260	24

L-Lecturer, P-Practical, ESE- End Semester Examination, IM-Internal Marks, T-Tutorial

Subject Code	Subject Name
BT4451	Engineering Risk-Benefit Analysis
BT4452	Disaster Management
BT4453	Global Strategy & Technology
BT4454	Project Management
BT4455	Software Engineering

MATS UNIVERSITY

GULLU, ARANG, RAIPUR

Semester: B.Tech 4th Sem

Subject:-Structural Analysis -II

Total Theory Periods: - **40**

Total marks in end semester Exam: **100**

Minimum Number of Class test to be conducted: **02**

Branch:- Civil Engineering

Code:-BT440

Total Tutorial Periods: **10**

Objective of the Subject:

1. To learn the methods which are applied to analyse indeterminate structures.
2. To gain the expertise in analysis of indeterminate beams and rigid frames.
3. To develop professional skill in analyzing indeterminate pin jointed structures.
4. To learn to draw influence line diagrams for stress functions in indeterminate beams which may be useful for moving the maximum values of the stress functions.

Unit 1

Indeterminate beams, Principle of superposition, Analysis by consistent deformation method, Theorem of three moments, shear force and bending moment diagrams, sinking of support.

Unit 2

Strain energy application to beams, frame & trusses, Lack of fit

Unit 3

Moment Distribution Method, Application to indeterminate beams and rigid frames without sway & with sway problem.

Unit 4

Slope deflection method, Application to indeterminate beams and rigid frames without sway & with sway problem. Basics of Column analogy method.

Unit 5

Qualitative and Quantitative Influence lines of indeterminate beams by Muller Breslau Principle and its use.

Name of Text Books:

Structural Analysis – Punmia B.C. (Laxmi Publications)

Structural Analysis (Vol. – II) – Bhabhi Katti S. (Vikas Publishers)

Name of Reference Books:

Intermediate Structural Analysis – Wang. C.K. (McGraw Hill Book Company, 1983)

Matrix analysis of Framed Structures – Weaver, W. & Gere J.M. (CBS Publishers and Distribution, Delhi 1990)

Fundamentals of Structural Analysis – Lect & Vari (Tata McGraw Hill)

Structural Analysis – Pandit & Gupta (Tata McGraw Hill)

Theory of Structure – Ramamurtham S. (Dhanpat Rai Publication)

Outcomes of the Subject:

1. Capable of analyzing different kinds of structures such as determinate, indeterminate, rigid jointed or pin-jointed plane

**MATS UNIVERSITY
GULLU, ARANG, RAIPUR**

Semester: B.Tech 4th Sem
Subject:-Engineering Geology

Branch:- Civil Engineering
Code:-BT441

Total Theory Periods: - **40**

Total Tutorial Periods: **00**

Total marks in end semester Exam: **100**

Minimum Number of Class test to be conducted: **02**

Course Objectives:

1. To understand fundamental concepts of engineering geology
2. To learn about the various types of rocks and their properties.
3. To study about the Earthquakes, its causes, classification etc
4. To gain knowledge about Landslides, Land subsidence and Geological Hazards
5. To learn about Geological investigations in Civil Engg

UNIT 1 Minerals

Minerals, their physical properties, optical properties and chemical properties. The detailed study of certain rock forming minerals with respect to the physical properties.

Unit 2 Rocks and Rock deformation

Their origin, structure, texture, classification of rocks in brief and their suitability as Engineering materials, dip and strike of bed, Folds, Faults, joints, unconformity and their classification, causes and relation to engineering behavior of rock masses.

Unit 3 Earthquake

Earthquake, its causes, classification, seismic zones of India and Geological consideration for construction of building, reservoir related, earthquake problem and its preventive measures, distribution of seismic zones in India.

Unit 4 Landslides and Land subsidence

Landslides, its causes, classification and preventive measures, land subsidence, its causes and preventive measures.

Unit 5 Engineering Geological Sites Selection

Engineering Geological considerations for site selection of Dams and Reservoirs, Tunnels, Bridges and Highways, Geological Maps, concept of geological maps, important terminology used for map and making a section from the map.

Name of Text Books:

- A Textbook of Geology : Mukherjee P.K. (World Press Publishers)
- Engineering Geology : D.S. Arora (Mohindra Capital Publisher, Chandigarh)

Name of Reference Books:

- Geology and Engineering : Leggot, R.F. (Mc-Graw Hill, New York)
- Geology for Engineers : Blyth, F.G.M. (Arnold, London)
- Civil Engineering Geology : Cyril Sankey Fox (C. Lockwood and son, U.K.)
- Engineering and General Geology : Prabin Singh (Katson Publication House)

Course Outcomes:

Students will be able to:

1. Show the knowledge about engineering geology.
2. Show knowledge of the most important rocks and minerals and be able to identify them.
3. Analyze the Earthquakes and its various types.
4. Understand the characteristics of various Geological Hazards.
5. Do the Geological investigations; understand the geological conditions and geological maps.

Semester: B.Tech 4th Sem

Branch:- Civil Engineering

Subject:-Surveying II

Code:-BT442

Total Theory Periods: - **40**

Total Tutorial Periods: **00**

Total marks in end semester Exam: **100**

Minimum Number of Class test to be conducted: **02**

Course Objectives:

1. To be familiar with various aspects of Trilateration and Triangulation
2. To deal with the relevant computations, errors and observations.
3. To gain the knowledge of Tachometry, various systems, instruments etc.
4. To learn the concepts of Photographic and aerial surveying.
5. To learn and apply the concept of Hydrographic surveying.

Unit 1

Curves

Definition, classification of curves; Elements of circular, Transition and vertical curves, Theory and method of setting out simple, Transition and vertical curves. Special field problems.

Unit 2

Total station

Introduction, Features of total station- Angle measurement , Accessories ,Distance measurement etc.

Technical specification, orientation , Electronic data records ,Field procedures in topographic survey , Electronic distance measurement- Basic concept , Total station instruments.

Unit 3

Tacheometry

Definitions, Principles of stadia systems. Instrument constants, Substance and Tangential Systems. Construction and use of Reduction Tacheometers, Range Finders.

Unit 4

Photographic and aerial surveying

Photo theodolite, principle of the method of terrestrial photogrammetry, stereo photogrammetry, aerial surveying, scale and distortion of the vertical and tilted photograph, comparison between air photograph and map.

Unit 5

Hydrographic surveying

Introduction, shore line survey, soundings methods, gauges, equipment required for hydrographic surveying, sounding party, methods of locating soundings, reduction of soundings and plotting of soundings, problems related to hydrographic surveying.

Name of Text Books:

- Surveying (Vol. I & II) : Punmia, B.C. (Laxmi Publications, New Delhi, 1996)
- Surveying (Vol. I & II) : Kanetkar T.P. (Pune Vidyarthi Griha Prakashan, Pune)

Name of Reference Books:

- Engineering Surveying Technology : Kennie, T.J.M. and Petrie G. (Blackie & Sons Pvt. Ltd., London, 1990)
- Surveying (Vol. II & III) : Agor, R (Khanna publications, Delhi, 1995)
- Surveying (Vol. II & III) : Arora, K.R. (Standard Book House, Delhi, 1993)
- Solving Problems in Surveying : Bannister A. and Baker, R. (Longman Scientific Technical, U.K., 1994)

Course Outcomes:

Students will be able to:

1. Deal with the various aspects of Trilateration and Triangulation
2. Do the relevant computations, errors and observations.
3. Gain and apply the knowledge of Tacheometry, various systems, instruments etc.
4. Apply the concepts of Photographic and aerial surveying.
5. Efficiently deal with the Hydrographic surveying

**MATS UNIVERSITY
GULLU, ARANG, RAIPUR**

Semester: B.Tech 4th Sem
Subject:-Civil Engineering Drawing
Total Theory Periods: - **40**

Branch:- Civil Engineering
Code:-BT443
Total Tutorial Periods: **00**

Total marks in end semester Exam: **100**

Minimum Number of Class test to be conducted: **02**

Duration of end semester exam: 4 hours

Course Objectives:

1. Make student to understand General Principles of planning.
2. To understand the drawing of plan of single, double story residential buildings
3. To understand the Drawing of section of single and double story residential buildings
4. To provide an understanding drawing of elevation of building
5. To understand detailing of flush shutter, panelled shutter etc

Unit 1

General Principles of planning - Aspects, Prospects, Circulation, Grouping, Roominess, Sanitation, Economy, Elegance, Furniture requirements, flexibility, Privacy. Site selection and requirements of different public buildings such as hospitals, schools, hostels using line plan. Municipal regulations and bye-laws for residential buildings.

Unit 2

Drawing of plan of single, double story residential buildings and hostels, single line plan of primary health centre, school, canteen for given site requirements.

Unit 3

Drawing of elevation of single and double story residential buildings, primary health centre, school, hostel, canteen for given site requirements.

Unit 4

Drawing of section of single and double story residential buildings, primary health centre, school, hostel, canteen for given site requirements.

Unit 5

Detailing of flush shutter, panelled shutter, fully glazed, half glazed, half glazed and half paneled doors and windows, elements of perspective, example on simple blocks.

Name of Text Books:

- A course in Civil Engineering Drawing : V.B. Sikka (Katson Technical Publications)
- Civil Engineering Drawing : Shah, Kala and Patki (Tata McGraw Hill)

Name of Reference Books:

- A Textbook of Civil Engineering Drawing: Buildings ; R.P. Chandel (Katson Technical Publications)
- Planning and Designing Buildings : Y.S. Sane (Allies Book Stall and Engineering Book Publishing Co.)
- Hospitals: Planning, Design and Management : Kunders, Gopinath & Ashoka Katakam (Tata McGraw Hill)
- A Book of Home Plans : D. N. Ghose (CBS Publishers and Distributors)

Course Outcomes:

1. Students are expected to understand various methods of general principles of planning .
2. Students are expected to understand drawing plan of single, double story residential buildings
3. Students are expected to understand drawing of elevation of single & double story buildings

MATS UNIVERSITY
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Semester: B.Tech 4th Sem
Subject:-Building Construction

Branch:- Civil Engineering
Code:-BT444

Total Theory Periods: - **40**

Total Tutorial Periods: **00**

Total marks in end semester Exam: **100**

Minimum Number of Class test to be conducted: **02**

Course Objectives:

1. Make student to understand various parts of building.
2. Make student to understand foundations of structures.
3. To understand the safety precautions & sound proofing.
4. To prepare a base for Civil Engineering Drawing.
5. To provide an understanding about the relevance and application in Civil Engineering Projects.

UNIT 1 Foundation

Brief study of different types of foundations, nature of soil (expansive or non-expansive, alluvial or residual, sandy or clayey for settlement etc.), approximate values of bearing capacities, breadth and depth of foundation, typical cross sections for foundations under walls and R.C.C. Columns. Foundations in black cotton soils, under reamed pile foundations, foundation failures and remedial measures.

UNIT 2 Masonry

Technical terms in masonry, classification and brief specifications of stone masonry, bonds in brick masonry, general principles to be observed in stone and Brick Masonry Construction.

Walls

Different types (load bearing, cavity-walls and partition walls), thickness considerations.

Doors, Windows And Lintels

Different types based on materials and methods of construction, technical terms, size and locations.

UNIT 3 Floors

Ground and upper floors, various types, their suitability, construction details of concrete and terrazzo floors, Floor tiles.

Roofs - Technical terms and different types of pitched and flat roofs. Various roof coverings for pitched and flat roofs.

Formwork- Different types of formwork, stripping times

UNIT 4 Damp Proofing

Causes and effect of Dampness, parts of a building likely to be affected most, methods of damp proofing in different locations including roofs.

Plastering And Pointing - Types and considerations during plastering and pointing

Joints- Construction, Contraction and Expansion Joints.

UNIT 5 Stairs

Types based on geometry and material, suitability, proportioning of stairs, lifts and escalators.

Sound Proofing

Materials and Methods of sound proof construction.

Fire Proofing- Materials and Methods of fire proof construction.

Name of Text Books:

- Building Construction : B.C. Punmia (Laxmi Publication Pvt. Ltd.)
- Building Construction : Sushil Kumar (Standard Publication Distributors)

Name of Reference Books:

- Building Construction : Gurucharan Singh (Standard Publication Distributors)
- Building Construction : S. C. Rangwala (Charotar Publishing House, Anand, Gujarat)

Course Outcome:

1. Students are expected to understand various parts of building.
2. Students are expected to understand various types of bonds.
3. Students are expected to read construction drawing of form work.
4. Students are expected to understand importance of safety in construction.

**MATS UNIVERSITY
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Semester: B.Tech 4th Sem
Subject:-Disaster Management

Branch:- Civil Engineering
Code:-BT4452

Total Theory Periods: - **40**

Total Tutorial Periods: **00**

Total marks in end semester Exam: **100**

Minimum Number of Class test to be conducted: **02**

Course Objectives:

1. Make students learn to overcome disaster
2. To understand the cause of disaster and its prevention techniques
3. To understand the basic of disaster management from historical problems

UNIT 1:

Nature of disasters – natural and other disasters, Earthquakes, floods, draught, cyclones, fire and other environmental disasters.

UNIT 2:

Behavior of structures in disaster prone areas, Disaster zoning, Hazard assessment, Environmental Impact Assessment.

UNIT 3:

Methods of mitigating damage during disasters, disaster preparedness.

UNIT 4:

Management systems during disasters, Construction Technology for mitigation of damage of structures.

UNIT 5:

Short-term and long-term relief measures.

Name of Text Books:

Design of Earthquake Resistant Buildings – Minoru Wakabayashi (McGraw Hill Publication) Dynamics of Structures: Theory and Application to Earthquake Engineering (2nd edition) – Anil K Chopra (Pearson Education Publication)

Course Outcomes:

1. Students are expected to understand various methods of general principles of planning .
2. Students are expected to understand drawing plan of single, double story residential buildings
3. Students are expected to understand drawing of elevation of single & double story buildings

**MATS UNIVERSITY
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Semester: B.Tech 4th Sem**Branch:- Civil Engineering****Subject:- Engineering-Risk-Benefit-Analysis Code:-BT4451****Total Theory Periods: - 40****Total Tutorial Periods: 00****Total marks in end semester Exam: 100****Minimum Number of Class test to be conducted: 02****Course Objectives:**

1. Make student understand the subject and its uses in engineering
2. To make students understand the basics and utilize them according to modern needs
3. To make students learn the problems faced while using this subject and how to prevent those problems

Part 1: Reliability and probabilistic risk assessment (RPRA)

Introduction

- 1 RPRA1: The logic of certainty
- 2 RPRA 2: Elements of probability theory
- 3 RPRA 3: Probability distributions
- 4 RPRA 3: Probability distributions (cont.)
- 5 RPRA 4: Availability
- 6 RPRA 5: Data and epistemic uncertainties; statistics
- 7 RPRA 6: Probabilistic risk assessment
- 8 RPRA 6: Probabilistic risk assessment (cont.)
- 9 RPRA 7: Risk management
- 10 Guest lecture
- 11 Guest lecture
- 12 RPRA quiz

Part II: Decision analysis (DA)

- 13 DA 1: The multistage decision model
- 14 DA 2: The value of perfect information
- 15 DA 3: The axioms of rational behavior
- 16 DA 4: Introduction to utility
DA 5: Risk aversion
- 17 DA 6: Multiattribute utility theory
- 18 DA7: Decision analysis and risk management
- 19 Guest lecture
- 20 DA quiz

Part III: Cost-benefit analysis (CBA)

- 21 CBA 1: Background and fundamental premises
- 22 CBA 2: The time value of money
- 23 CBA 3: Bases for comparison of alternatives
- 24 CBA 4: Including uncertainty
- 25 CBA 5: Evaluating public activities
- 26 Guest lecture
- 27 CBA quiz

Course Outcomes:

1. Students are expected to understand to learn the subject well and use it in practicality
2. Students are expected to understand the need of this subject and can manage to use it with other technology
3. Students are expected to understand the restrictions in use of this subject

**MATS UNIVERSITY
GULLU, ARANG, RAIPUR**

Semester: B.Tech 4th Sem

Branch:- Civil Engineering

Subject:- Global Strategy & Technology

Code:-BT4453

Total Theory Periods: - **40**

Total Tutorial Periods: **00**

Total marks in end semester Exam: **100**

Minimum Number of Class test to be conducted: **02**

Course Objectives:

1. Make student understand the subject and its uses in engineering
2. To make students understand the basics and utilize them according to modern needs
3. To make students learn the problems faced while using this subject and how to prevent those problems

UNIT-1

Paper outline Each student will be expected to produce an extended outline of their paper (1,500 words). The outline will serve as a conceptual foundation, framework or background that will be used to analyze a specific theme for the final paper. Students will be expected to demonstrate their knowledge of the literature and its relevance to a specific field of interest they intend to examine in the final paper

UNIT-2

Module summary: International management is an introduction to the international banking operations and to the financing negotiation of a large project;

UNIT-3

Assessments: • Group homework : o Class presentation (70%) with PowerPoint deliverable o Group report (30%) with Word deliverable

UNIT-4

General introduction: main definitions and concepts. Enterprise Architecture and Application Strategy, IT Strategy IT Service Management Cloud computing and Digital Strategy IT Project Management and change enablement

UNIT-5

Multichannel strategy, definition, objectives and consequences on management, Multichannel strategy and Selling process, Tools of multichannel strategy, database and CRM / SFA systems, Online consumer behavior, Online business models

Course Outcomes:

1. Students are expected to understand to learn the subject well and use it in practicality
2. Students are expected to understand the need of this subject and can manage to use it with other technology
3. Students are expected to understand the restrictions in use of this subject

MATS UNIVERSITY GULLU, ARANG, RAIPUR

Semester: B.Tech 4th Sem

Subject:- Project Management

Total Theory Periods: - **40**

Total marks in end semester Exam: **100**

Minimum Number of Class test to be conducted: **02**

Branch:- Civil Engineering

Code:-BT4454

Total Tutorial Periods: **00**

Course Objectives:

1. Make student understand the subject and its uses in engineering
2. To make students understand the basics and utilize them according to modern needs
3. To make students learn the problems faced while using this subject and how to prevent those problems

Unit 1: Project Organization

Project organization involves selecting an appropriate project organization-structure and establishing the Organizational Breakdown Structure (OBS) for the project. Through an analysis of the project information-transfer needs (i.e., who needs information from whom), project teams and a reporting structure may be determined. Specifically, several product development processes and the Design Structure Matrix are studied.

Unit 2: Project Planning

Project planning involves establishing the Work Breakdown Structure and mapping this structure to the established OBS. Furthermore, a project budget and Cost Breakdown Structure are developed and mapped to the OBS and WBS. The planning phase also includes establishing an appropriate timeline for the project in the context of resource constraints. Finally, the project manager must acknowledge that very few (if any) of the estimates and predictions at hand will prove to be accurate in the future; she needs to account for risk factors and their possible consequences on the schedule, budget, quality and environment while planning a project.

Specific methodologies for planning include:

- The Critical Path Method (CPM)
- The Precedence Diagramming Method (PDM)
- The Program Evaluation and Review Technique (PERT)
- The Graphical Evaluation and Review Technique (GERT)
- Queue - Graphical Evaluation and Review Technique (GERT)
- Simulation Language for Alternative Modelling (SLAM)
- Dynamic Planning and Control Methodology (DPM)
- Critical Chain Planning
- Resource Loading

Many software tools, such as Microsoft® Project, Primavera Project Planner®, Primavera® Monte Carlo, Crystal Ball® and ProChain® are available to the project manager for deterministic and probabilistic planning. In this course we will use the following:

- Primavera® P3 — for deterministic time and resource scheduling
- Primavera® Monte Carlo — for probabilistic time and resource scheduling
- Primavera® Expedition — for documenting multiple and complex projects
- Pro Chain® — for scheduling with the critical chain method
- Crystal Ball® — for risk analysis
- Vensim® — for system dynamics analysis

Unit 3: Project Monitoring

Project Monitoring refers to the configuration and metrics used to monitor the progress of a project throughout its life. Particular questions of interest to the project manager are:

- Is the project progressing according to the schedule?
- Will the project be completed within the allocated budget?
- Will the product perform as expected?
- If there are any deviations in schedule, budget or quality, how efficiently and how fast are they captured, reported and acted upon?

Earned Value Analysis is one project management tool used to help answer these questions. Reports are based on the organization and reporting structure established previously.

Unit 4: Project Control

Based on the information gathered through the Project Monitoring system, corrective action may be required to keep a project on track. The Project Control section of the course describes techniques to help realign projects that have gone awry. Corrective

action may be needed in many areas such as project scope, product performance, project schedule, and project budget. Project Control also requires a clear trace as to when and how changes are made to baselines as well as a clear understanding and documentation of project configurations.

Unit 5: Project Learning

Project Learning is recognized by organizations as one of the most important factors for success in current and future projects. Through life-cycle and post-mortem analysis, the project manager may identify areas to be emphasized or more closely managed in future projects. Such areas include:

- Resource allocation,
- Risk and uncertainty,
- Budget constraints,
- Project feasibility, and
- Change management.

Course Outcomes:

1. Students are expected to understand to learn the subject well and use it in practicality
2. Students are expected to understand the need of this subject and can manage to use it with other technology
3. Students are expected to understand the restrictions in use of this subject

MATS UNIVERSITY GULLU, ARANG, RAIPUR

Semester: B.Tech 4th Sem

Branch:- Civil Engineering

Subject:- Software Engineering

Code:-BT4455

Total Theory Periods: - **40**

Total Tutorial Periods: **00**

Total marks in end semester Exam: **100**

Minimum Number of Class test to be conducted: **02**

Course Objectives:

1. Make student understand the subject and its uses in engineering
2. To make students understand the basics and utilize them according to modern needs
3. To make students learn the problems faced while using this subject and how to prevent those problems

Unit I: C++ and OOP

Covers classes and objects, inheritance, virtual functions, abstract classes, polymorphism

Unit II: Algorithms

Searching and sorting methods

Unit III: Java®

Java applications and applets, Abstract Windowing Toolkit, Graphics, Image Processing, Threads. Integrating Java ®and C++.

Unit IV: Project

Selected advanced topics in Java® and C++. Simulation (term project) using Java® and/or C++.

Text Book:

Lippman, S. and J. Lajoie. *C++ Primer*. 3rd ed. Reading, MA: Addison Wesley Professional. April 1998. ISBN: 9780201824704.

Sedgewick, R. *Algorithms in C++*. Reading, MA: Addison-Wesley Longman, Incorporated. June 2001. ISBN: 0201849380

Course Outcomes:

1. Students are expected to understand to learn the subject well and use it in practicality
2. Students are expected to understand the need of this subject and can manage to use it with other technology
3. Students are expected to understand the restrictions in use of this subject

Department of Civil Engineering
List of Experiment

Subject: Civil Engineering Drawing Lab

Semester: IV

Code: BT 446

1. To draw section and elevation of fully glazed, half glazed and half glazed-half paneled doors and windows.
2. To draw the plan and section of a fully furnished bathroom.
3. To draw the plan and section of a fully furnished kitchen.
4. To draw the line plan of a Primary School building.
5. To draw the line plan of a Hostel building.

6. To draw the line plan of a Hospital building.
7. To draw the line plan of a single storey residential building.
8. To draw ground floor plan of residential building.
9. To draw the section of a building showing maximum details
10. To draw the corresponding front elevation of residential building.

Department of Civil Engineering
List of Experiment

Subject: Surveying Field Work
Semester: IV
Code: BT 447

1. Study of Total Station.
2. Study of Auto Level.
3. To find level at different points in field with the help of Auto Level.
4. Profile Leveling with the help of Auto Level for highway.
5. To observe a closed field traverse with the help of compass.
6. To find level at different points in field with the help of Dumpy Level.
7. Determination of Tachometric constants.

8. Study of Electronic Digital Theodolite.
9. Study of Plane Table Survey.
10. Field Survey and Site Visit of a building.

Department of Civil Engineering List of Experiment

Subject: Structural Analysis-II Lab
Semester: IV
Code: BT 448

Experiments to be performed (Min 10 experiments)

1. To determine the flexural rigidity (EI) for a given beam
2. To verify the Maxwell's theorem of reciprocal deflection
3. To determine the vertical deflections of a variety of curved bars.
4. To obtain the horizontal deflection and deformed shape of portal frames with different end conditions.
5. To determine the strain in an externally loaded beam with the help of digital strain indicator.

6. Analysis of determinate beams on a Standard Structural Analysis Package such as SAP2000.
7. Analysis of indeterminate beams on a Standard Structural Analysis Package such as SAP2000.
8. Analysis of determinate pin-jointed frames on a Standard Structural Analysis Package such as SAP2000.
9. Analysis of indeterminate pin-jointed frames on latest version of a Standard Structural Analysis Package such as SAP2000.
10. Analysis of determinate rigid frames on latest version of a Standard Structural Analysis Package such as SAP2000.
11. Analysis of indeterminate rigid frames on latest version of a Standard Structural Analysis Package such as SAP2000.
12. To draw influence lines for determinate beams on latest version of a Standard Structural Analysis Package such as SAP2000.
13. To draw influence lines for indeterminate beams on latest version of a Standard Structural Analysis Package such as SAP2000.

List of Equipments / Machine Required:

Elastic properties of beam apparatus
Maxwell's law of reciprocal deflection apparatus
Universal frame with variety of curved bars
Universal frame with variety of portal frames
Digital Strain Indicator
Dial gauges for measuring deflections
Weights and hangers to apply loads
Latest Release of Software Package SAP2000 (Computers & Structures Inc., USA)

Recommended Books:

Reference Manual of Respective Software
Verification Manual of Respective Software

Department of Civil Engineering
List of Experiment

Subject: Engineering Geology Lab
Semester: IV
Code: BT 449

1. Megascopic description of Granite, Pegmatite and Synite.
2. Megascopic description of Basalt, Gabbro, Charnokite and Dolerite.
3. Megascopic description of Limestone, Sand stone and Shale.
4. Megascopic description of Conglomerate, Marble and Skate.
5. Megascopic description of Quartzite, Schist and Gneiss.
6. Megascopic description of Tale, Gypsum and Calcite.
7. Megascopic description of Feldspar, Quartz and Corundum.
8. Megascopic description of Hematite, Magnetite and Bauxite.

9. Study of structural models of Fault, Fold and Unconformity.
10. Study of simple geological map.

SEMESTER-V